

UPnP

Device Certification Process Document



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TABLE OF CONTENTS

1. SCOPE AND PURPOSE	3
2. BACKGROUND.....	3
2.1. DEFINITION OF UPNP	3
3. DEVICE CERTIFICATION.....	5
3.1. WHAT DOES UPNP® DEVICE CERTIFICATION MEAN?.....	5
3.2. WHAT DOES THE UPNP® CERTIFICATION MARK REPRESENT?	5
3.3. WHY OBTAIN A LICENSE TO USE THE CERTIFICATION MARK?	6
3.4. WHAT DOES A DEVICE NEED FOR CERTIFICATION?	6
3.5. WHAT TYPES OF DEVICES CAN BE CERTIFIED?	7
3.6. WHO CAN SUBMIT DEVICES FOR CERTIFICATION?.....	8
4. DETAILS OF THE UPNP DEVICE CERTIFICATION PROCESS	8
4.1. AUDITING.....	9
4.2. RE-CERTIFICATION	10
5. TESTING	11
5.1. SCOPE OF UPNP TESTING.....	11
5.2. INPUTS AND COMPONENTS OF THE TEST TOOL.....	12
5.3. TEST TOOL APPROVAL PROCESS	14
5.4. PLUG FESTS.....	15
5.5. TEST PROCESS DETAILS	15
5.5.1. <i>Testing Rules</i>	15
5.5.2. <i>Types of Test Facilities</i>	15
5.5.3. <i>Test Tool Problems</i>	16
5.5.4. <i>New Versions of the Test Tool</i>	16
5.5.5. <i>New Versions of the UPnP Architecture</i>	16
5.5.6. <i>Escalation of Test Issues</i>	17
5.5.7. <i>Support for UPnP Certified Devices</i>	17
5.5.8. <i>Enforcement of the UPnP Device Certification Process</i>	18

1. SCOPE AND PURPOSE

This *UPnP Device Certification Process Document* is the primary reference document for a vendor that wants to certify a device or control point as a *UPnP® Certified* device. It defines the certification process requirements, organization, functions, and policies. Supplemental information is available on the web site of the Open Interconnect Consortium (OIC) (<http://www.openinterconnect.org>) or the UPnP certification site (<https://members.upnp.org/default.asp>).

This UPnP Device Certification Process Document is based on the *UPnP Device Architecture* (UDA) and the standard XML *device descriptions* (referred to as “device control protocols” or “DCPs”).

The most current version of this document is available from the UPnP certification web site. Questions regarding this document should be sent to the OCF Administration via that web site. To ensure the success of the device certification process, OCF reserves the right to modify and/or amend this document as necessary.

This document DOES NOT outline the details of the OCF Device Certification Process for devices that implement the OCF standard. Visit the OCF website for more information about the OCF Certification Process and Requirements: www.openinterconnect.org.

2. BACKGROUND

2.1. Definition of UPnP

UPnP technology is based on an open architecture for pervasive peer-to-peer network interoperability of intelligent devices including, but not limited to, appliances and PCs. UPnP technology uses Internet components, including IP, TCP, UDP, HTTP, and XML. Like the Internet, communication is based on declarative data expressed in XML using protocols such as HTTP.

2.2. Role of OIC

Effective January 1, 2016, the Open Interconnect Consortium (OIC) acquired the assets of UPnP Forum, and OCF now administers the UPnP device certification process. UPnP Forum was created to foster connectivity of all types of intelligent devices by defining device descriptions for various device types based on the UPnP architecture. The OCF is a diverse collection of leading technology companies, organizations and individuals structured as a not for profit consortium with the mission to develop standards, a reference implementation and certification procedures for devices that will make up the Internet of Things. In addition to administering the UPnP certification program, OCF undertakes activities to ensure interoperability of devices that conform to OCF specifications and has a separate certification program for OCF certification. This

document outlines the UPnP certification procedure guidelines for OCF members and non-OCF members who sign the UPnP Certification Mark License Agreement.

The **OCF Board** consists of member companies that oversee OCF and UPnP activities. They work with the UPnP Work Group which is responsible for creating and maintaining UPnP device standards, UPnP certification criteria and rules, and the overall operation of UPnP activity within OIC. The UPnP Work Group, with the assistance of the OCF Certification Body and Certification Task Group, oversees the UPnP device certification process. The OCF Board selects, hires and manages the OCF Certification Body and any Certification Management Consulting Firm that administers the UPnP certification process according to the rules specified herein.

- The **Certification Management Consulting Firm** is a third-party consulting firm that specializes in the management of non-profit corporations. This group is composed of various people who help manage OCF and the UPnP Work Group and includes at least:
 - One or more **Facilitators** who manage and administer OCF and UPnP events and communications, such as meetings, votes, mailing lists, and the Web site. Facilitators must act within the policies outlined by the OCF Board and herein; they cannot make policy decisions about device certification. Facilitators receive direction from the OCF Board and UPnP Work Group and provide proper administration of OCF to enable an efficient device certification process. They also serve as points of contact for device certification questions from vendors, providing direction when possible or relaying information to the appropriate party when necessary.
 - One or more **Test Reviewers** who manage the test review process, which includes receiving and reviewing test logs, logging device information, confirming pass/fail results, communicating with vendors about test results and maintaining a database that tracks the status of all devices submitted for certification and those that have qualified for a license to the certification mark.

The **UPnP Work Group** consists of OCF members; it addresses compliance issues associated with UPnP devices and oversees the device certification process as defined in this document. The Work Group works with the Test Reviewers, who administer the certification process, to review test results, assist in identifying the cause of test failures, remedy test tool problems, audit the testing process, and see that the certified device database is properly maintained. They also address any technical issues that arise during the test review process.

The **UPnP Task Groups** (TGs) consist of OCF members that are interested in a particular UPnP device type (for example, audio/video, home automation, printing/imaging, and so on). The TGs agree upon the devices to be standardized, generate the device standards, implement the samples and submit the standards and results of the sample implementations along with any semantic test requirements to the OCF Board and Members. The flow chart in Appendix A outlines the process for creating UPnP device standards.

The **OCF Legal Counsel** is a third-party attorney (or law firm) who oversees the incorporation of OIC, which includes completing the articles of incorporation, corporate bylaws, OCF membership agreement, UPnP Certification Mark License Agreement, and handling antitrust, licensing, certification and certification mark registration issues.

3. DEVICE CERTIFICATION

3.1. What Does UPnP® Device Certification Mean?

Certification is the process used to determine if a device complies with the applicable UPnP standard – that is, whether the device or control point exhibits the behavior specified in the corresponding device standard, in accordance with the UDA. Compliance indicates that different devices from different vendors that support the same device standard are interchangeable with respect to that standard. For example, a vendor can manufacture a control point for a UPnP certified printer independent of the specific vendors who are manufacturing the printers (that is, if a control point works with one brand of a UPnP certified device, it will also work with another brand of the same UPnP certified device).

Without limitation, certification does not ensure:

- **General interoperability:** Certification testing increases the probability of interoperability, but it does not guarantee general interoperability. For instance, (1) certification testing does not cover all permutations of control points and devices; and (2) the behavior of the networked system depends on the underlying network, including traffic generated by other devices. Certification testing cannot account for all of these scenarios.
- **Correct real-world behavior:** The scope of certification testing does not include the correct physical functioning of a device. For example, while certification testing can validate that an HVAC system responds to temperature control commands, it does not confirm that the temperature was actually affected.
- **Correctness of vendor extensions:** Certification tests do not cover non-standard UPnP functions such as vendor extensions to a standard device description.

3.2. What Does the UPnP® Certification Mark Represent?

The UPnP certification mark on a device indicates that the device has been tested and certified according to the Certification Mark License Agreement, including the process outlined in this document.

The UPnP certification mark does not denote:

- The physical medium that the device uses (such as power line, phone line, Ethernet, or radio frequency); thus it is possible for devices that use different physical media to be UPnP compliant, but such devices normally would not directly interoperate with each other.

- Whether the device has vendor extended services in it.
- An endorsement of the device by OIC.

It is the vendor's responsibility to mark its devices and associated marketing material clearly with respect to the meaning and limits of device certification.

3.3. Why Obtain a License to Use the Certification Mark?

Certification and a license to use the certification mark are important for several reasons; among these are:

- The certification process means that devices meet a common standard, even among devices from different vendors.
- The certification mark is an exclusive mark that may only be used on devices that are certified as UPnP compliant devices, and thus represents a recognized seal of compliance with the UPnP standard.

Those who are interested in devices with a certification mark include:

- Device vendors that want to use the certification mark to reach a larger market for their devices.
- Channel suppliers that sell and install devices and want functionality of a known compatibility level.
- End customers who want different vendors' devices to work according to the same standard.
- Industry organizations (e.g. DLNA) that require UPnP certification as a pre-requisite to their certification program.

3.4. What Does a Device Need for Certification?

To obtain a UPnP device certificate and a license to use the certification mark, a device is tested and must meet the following criteria:

- The device must correctly support the device-independent UPnP protocols specified in the UDA (for example, addressing, discovery and so on).
- The device must correctly support the relevant device-dependent UPnP protocols and syntax specified in the applicable UPnP device standard.
- The entity proposing the device for certification must be a member of OCF and/or qualify for a license to the certification mark under the UPnP Certification Mark License Agreement.

3.5. What Types of Devices Can Be Certified?

The device certification process, and hence the certification mark, applies for these types of devices, which are describe in more detail next:

- Native devices
- Bridges
- Control points

Both hardware and software devices are eligible for certification.

To be certified, devices must be compliant with at least one standard device description that includes at least one service. If a multi-function device has one UPnP certified device in it and several uncertified devices in it, the vendor must ensure that the advertising for this multi-function device explains this (and does not advertise all of the devices within the multi-function device as “UPnP certified”).

3.5.1. Native Devices

A native device that can be UPnP certified is one that directly implements the UPnP architecture and device standard in its own componentry. A native device is the most straightforward device to test, as it is tested against the device standard, and can be tested (in most situations) on its own (that is, it is not dependent on any other device).

3.5.2. Bridges

A bridge device that can be UPnP certified is one that maps UPnP protocols to other device protocols, for example, to allow legacy uncertified devices to participate in a network with UPnP certified devices. If a bridge includes a complete simulator independent of the device(s) being bridged, then the bridge can get certified and qualify for a license by itself (see Figure 3). However, if a bridge does not contain a complete simulator (i.e., a complete device), then the bridge must be tested while connected to its associated device. In this latter situation, the device, with the bridge, together can be certified and bear the certification mark (the bridge alone cannot bear the certification mark), but in such situation the vendor must state in connection with all uses of the certification mark on or for the certified bridge device that the bridge is only certified in conjunction with the device. See Section 5 for more details about the scope of UPnP testing.

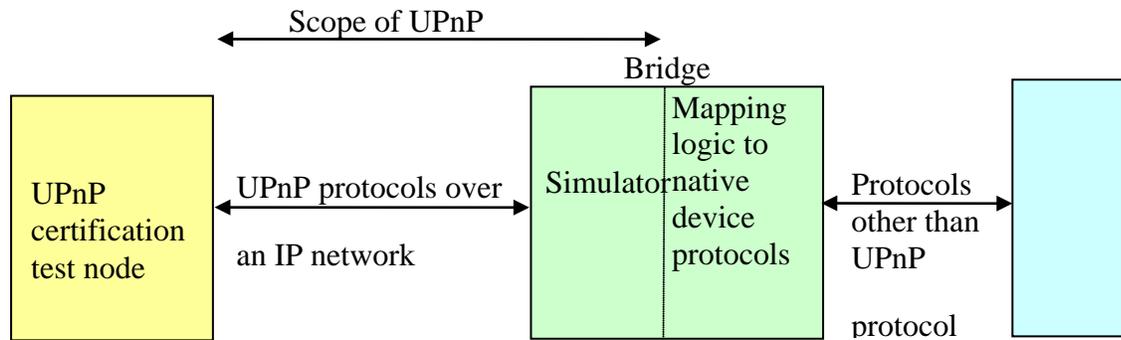


Figure 3: Testing of UPnP Bridges

3.5.3. Control Points

Control points require a different test methodology than devices, since control points are initiating the actions, while devices are receiving and executing them. The test tool supports testing of control points by providing a simulator that can interpret specific commands from a control point and return appropriate responses. Note: a device can be both a control point and controlled device. If certified, this device can bear the certification mark.

3.6. Who Can Submit Devices for Certification?

The device certification process is open to any entity who:

- is a member of OIC; and/or
- receives a license to use the applicable test as set forth in the UPnP Certification Mark License Agreement; and
- has ownership or control over device(s) that support UPnP functionality.

4. DETAILS OF THE UPnP DEVICE CERTIFICATION PROCESS

The detailed steps that an entity must follow to certify a device are:

1. The entity signs the UPnP Certification Mark License Agreement; fees will be set by OCF from time to time. OCF grants a license to use the applicable test as set forth in the UPnP Certification Mark License Agreement. Members of OCF and non-members of OCF are eligible to certify UPnP devices by signing this agreement and paying the applicable fee.
2. The Vendor obtains access to the test tool on the UPnP certification web site.

3. The Vendor runs the test tool either at a third-party lab or in-house.
4. The Vendor submits the test logs, device registration form (see Appendix B; forms will also be available from the UPnP certification web site) and nominal registration fee (if applicable) to the Test Reviewer. A Vendor must submit a registration form and registration fee *per device* (if applicable).
5. The Test Reviewer reviews the test results and provides feedback to the Vendor about whether the device has passed the test. Initially up to five working days are targeted for this review; the eventual goal is to provide the feedback within two working days.
6. If the device passes the test, the vendor is notified and receives a formal Award Letter and Certificate of Conformity for this particular device. The vendor may then use the certification mark on the certified device in accordance with the terms and conditions set forth in the Certification Mark License Agreement, Logo Usage Guidelines and FAQs, which will be accessible to the vendor on the UPnP certification web site. OCF will place the device name, device description, device type and unique identifier information in the certified device database administered by the Certification Management Consulting Firm.
7. If the device failed the test, the vendor is notified; no certificate is issued and the vendor may not market the device as UPnP certified nor use the certification mark in connection with the device. It is up to the vendor whether to alter the device and retest.
8. The entity abides at all times by the terms of the UPnP Certification Mark License Agreement.

See the flow chart in Appendix C for a graphical representation of this device certification process.

4.1. Auditing

For the purpose of maintaining the integrity of the certification mark, the OCF Board of Directors with the assistance of the UPnP Work Group will audit devices from time to time via the Test Reviewer or other third party to determine whether the selected certified devices pass the applicable test.

The OCF Board reserves the right to audit certified devices and any other aspect of the UPnP device certification process (such as certification mark usage). To perform such an audit, a certified device is obtained from the applicable Vendor or purchased by OIC. The device to be audit tested will be selected and tested by OIC's Test Reviewer or a third-party designated by the Certification Management Consulting Firm. The Test Reviewer will test this device against the original test the device was certified with, or if the original test had a significant bug, the debugged version of this test. Results of this testing are then provided to the vendor.

If the product passes the audit testing, it maintains its certification mark and the vendor need not pay for the costs associated with the audit test.

If the product fails audit testing, the vendor has sixty (60) days to dispute the failure. During this 60-day grace period, the vendor can continue to use the UPnP certification mark. If, after 60 days, it has been determined by OCF that the device passes the applicable test, the vendor need not reimburse OCF for costs associated with the audit testing. However, if, after sixty (60) days, it has

been determined by OCF that the device still fails, the vendor must within an additional sixty (60) days of notice by OIC: (1) reimburse OCF for any and all costs and expenses associated with the audit; (2) correct the device and re-test it against the applicable test; and (3) submit evidence of a passing result of the audited device (as corrected) when tested against the applicable test. The certification mark may be used in this additional 60 day grace period also. In the event the audited device still does not pass the applicable test, (1) the audited device will be de-certified; (2) OCF may revoke the license rights granted to vendor per the UPnP Certification Mark License Agreement with respect to the device at issue; and (3) and vendor will promptly cease and cause to be discontinued all uses of the certification mark in connection with the audited device, per the UPnP Certification Mark License Agreement.

Audit testing can occur on any device type. Audits will occur either as a result of a random selection by the Test Reviewer or because OCF has probable cause to question the proper certification of a particular device (e.g., by way of consumer complaints as to the UPnP functionality of a certified device, modifications to the device subsequent to certification, in-field observations, etc.). In these situations, if the OCF Board determines there is probable cause for concern as to the proper certification of a device, it will direct the Test Reviewer to conduct an audit of that device.

OCF reserves the right to accredit test labs in the future, for the purpose of performing audit testing.

4.2. Re-Certification

It is the vendor's responsibility to re-test and re-certify a device that has any change that has any possibility of impacting the UPnP functionality or when the certification has expired. OCF will place in the certified device database only those modified devices that are certified by OCF after any such change in the device. This database will contain the version number of the device for which test logs were reviewed. Therefore, if companies modify the device and do not re-test and re-submit the test logs to OIC, the most recent version number will not be in the certified device database and the vendor has no right to use the certification mark in connection with the device as modified.

In the event a Certified Device is modified (from the exact version tested under the UPnP Device Certification Process according to which the Certificate of Conformity was issued) in a way that *does not* impact the compliance of the device with the UPnP Standards, the Vendor shall provide to OCF a sworn declaration that such modification does not impact the compliance of the device with the UPnP Standards, register the modified device using the web-based form and submit the passing test logs from the previously certified device for which the UPnP functionality is identical. NOTE: If a new test tool version has been released since the time of a Vendor's previous certification and this test tool version is required for the device type version seeking re-certification, the Vendor is required to re-test their device and submit new passing test logs against the latest test tool release.

If granted certification, the device will be added to the certified device database and Vendor can then continue to enjoy all rights granted herein to the extent such declaration is accurate.

Guidelines for re-testing of Modified Devices:

Re-test required:

- Adding/removing one or more features of the device (e.g. adding or removing an optional action or changing xml (fragments) in a request or response of an action)
- Migrating to a newer version of the UDA
- Migrating to a newer version of a UPnP stack
- Changing the operating system, when there is a dependency on acquiring the network address of the device
- A new version of the official UPnP Certification Test Tool has been released since the time of a Vendor's previous certification and this test tool version is required for the device type version seeking re-certification.

Re-test not required:

- Non-functional changes such as color, label, brand name changes, and re-packaging
- Reseller vendor change (no functional change, no firmware change). Retest not required only if reseller is a Vendor who has signed the UPnP Certification Mark License Agreement and is up-to-date on annual dues. Refer to section 5.5.1 of this document.

If re-testing is not required, the Vendor should submit an online device submission form, but may submit the passing test log of the previously-certified device upon which the modified device is based.

5. TESTING

5.1. Scope of UPnP Testing

The scope of certification testing is limited to the aspects of a device related to the UPnP device standard including addressing, discovery, description, control, and eventing. The scope is limited to a simulation of UPnP functionality, defined as protocol and syntax tests, and, if specified by the TGs, semantic tests. It does not include the actual behavior and functioning (for example, mechanical, thermal, and electrical properties) of the device (see Figure 4).

For example, the test for a UPnP certified Set top box will determine that the Set top box conforms to all applicable UPnP protocols (including the generation of errors) and that it generates well formed events. It will not confirm the actual behavior of the device regarding the mandatory behaviors determined by the working committee. However, this will not cover the full functionality of the device, since some behavioral aspects of such a device can be out of scope of the UPnP (for example, the correctness of playback of a certain file format).

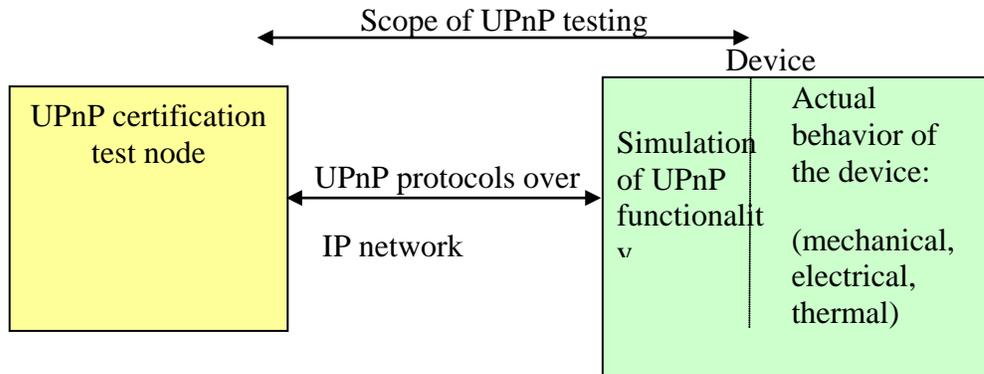
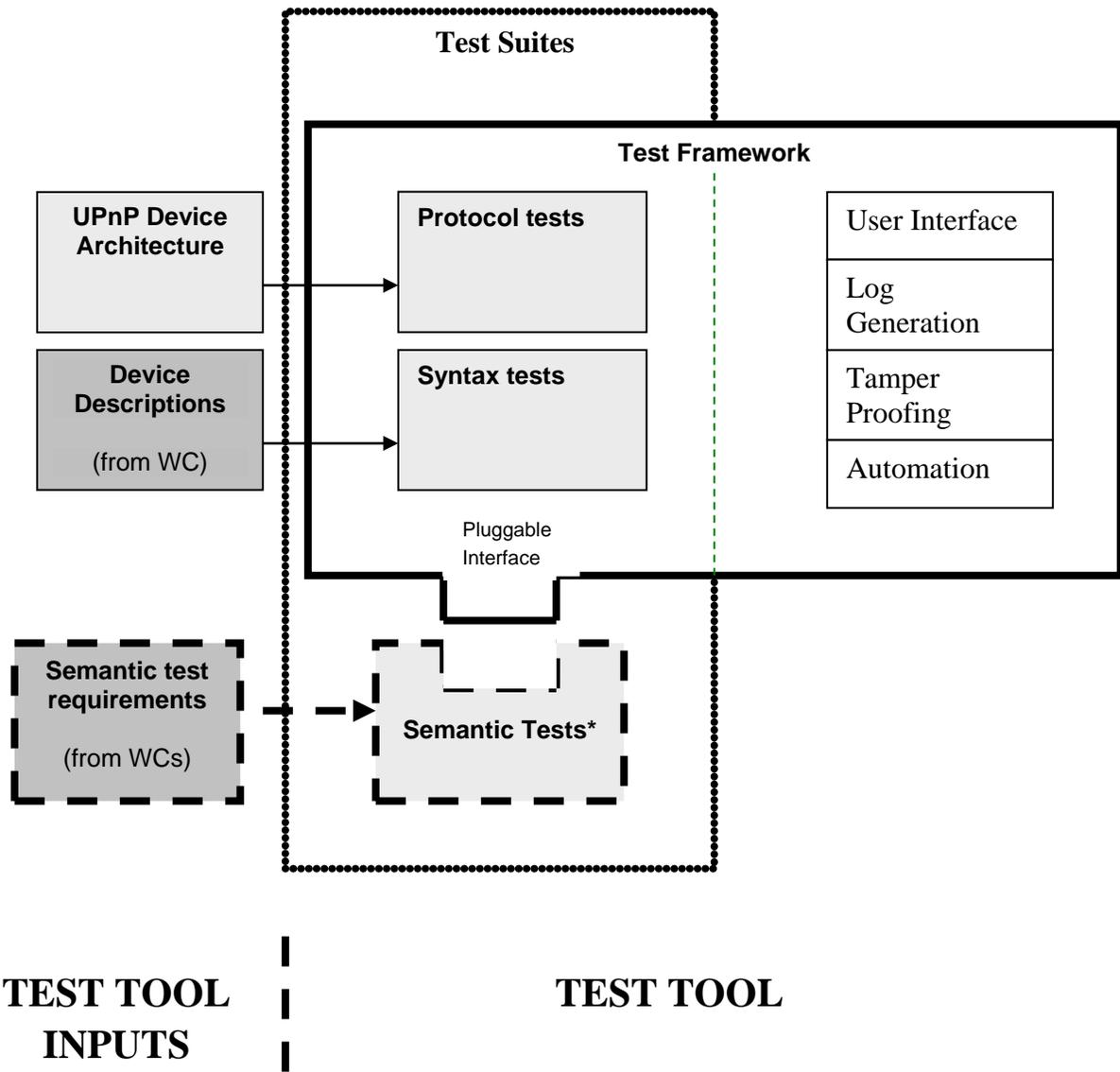


Figure 4 - Scope of UPnP testing

5.2. Inputs and Components of the Test Tool

A key part of the certification process is the software known as the “test tool”, which probes devices under test and examines the devices’ responses for correctness. The test tool has 3 parts: protocol tests, syntax test generation and semantic tests. The protocol tests are derived from the UDA and the syntax tests (including schema testing) are derived from device descriptions. The details about how a WC expresses the semantic test requirements and how these tests are accommodated by the tool are to be determined. Please refer to the Reference Guide documentation included in the test tool download for more information. Semantic tests come from the semantic test requirements developed by the UPnP WG and its TGs. Figure 5 outlines these relationships.



Device independent
 Device dependent

* Tests may be device dependent also. The approach for semantic testing is still being finalized.

Figure 5: The UPnP Certification Test Tool Components and Inputs

The test framework, outlined in bold in Figure 5, includes all generic aspects of testing, hence the choice of the term “framework” to parallel the term “DCP framework” (or architecture). The test framework includes the protocol tests, syntax test generation and infrastructure aspects of the test, including the user interface, log generation, tamper proofing, and automation (mechanisms to allow the test to run with minimal human intervention). Note that if a TG specifies semantic test requirements, the test framework provides a mechanism to allow for these semantic tests to be added.

The test suites, as indicated by the dotted box in Figure 5, include protocol tests, syntax test generation and possibly semantic tests. These are discussed next.

- Protocol tests are derived directly from the UDA and need no UPnP TG input.
- Syntax tests are derived from the device description. The test tool generates syntax tests for each device and service based on a configuration file provided by the TG. The configuration file includes the device descriptions, with added annotations for testing such as an indication of optional components. Note that TGs will update these configuration files each time the device description changes.
- Semantic test requirements are specified by the TGs if deemed important for the specific device type. Examples of semantic tests include testing combinations of states and actions; for example, if content is not loaded in a media server then the play action should result in an error. The details about how a TG expresses the semantic test requirements and how these tests are accommodated by the tool are to be determined.

5.3. Test Tool Approval Process

Test tools are approved by the OCF in two stages. The test framework will be approved once, when initially completed, and the test input from the TGs (which includes configuration files and might include semantic tests) for each device type will be approved as part of the device description approval process.

- The test framework, which includes the protocol testing and the syntax test generation, is reviewed and approved initially by the UPnP WG, and again whenever it is significantly modified. The initial test framework will be approved before the first device standard is approved.
- The test input from the UPnP TG may include semantic test requirements (if required) and the configuration files for syntax testing, both of which must correlate directly with the device standard. This input is reviewed and approved as part of the device description review process. In addition, at least three sample implementations are tested. After these three sample implementations (or more) have passed the applicable test under review, the TG chair for that device type, the UPnP WG chair, and sample implementers sign a form (see Appendix D) stating that the proposed device standard is complete and is ready for review by the full OCF membership. Then a minimum 60-day OIC-wide review occurs, followed by a period for the UPnP WG to either accept the proposed device description standard or request that the TG for that device alter the proposed standard. When the

device description is approved by the OCF Board, it becomes the device standard for that device class.

5.4. UPnP Plug Fests

In addition to the certification testing described previously, plug fests are a means for vendors to perform ad hoc testing of their devices with other vendors' devices. These plug fests are informal and are not part of or in any way related to the certification testing program; however, they provide a valuable venue for further testing of these devices in many practical permutations.

Further, it is natural for vendors to test interoperability with those devices that are likely to be used with their own devices (for example, a Set-top Box vendor might wish to test the Set-top Box with one or more devices that can serve as a remote control, such as a handheld computer).

5.5. Test Process Details

5.5.1. Testing Rules

Generally, all device types must be tested in order to be certified, with the following clarifications:

- If a composite device has as one of its parts a device that is already tested and certified as a UPnP compliant device, then the composite device may use the certification mark *if* it uses the certified part unmodified.
- If a party resells a UPnP certified device that already has the certification mark without changing its functionality as it pertains to its certification as a UPnP device, such as changing only the brand name or aesthetics, the reseller can use the certification mark without re-testing so long as the reseller has signed the Certification Mark License Agreement and is up-to-date on annual dues. This refers only to non-functional changes, such as color, label, brand name changes, re-packaging and so on. However, the reseller must submit a device registration form to OCF according to the terms of the UPnP Certification Mark License Agreement. The registration of these end products is beneficial for the reseller, as the reseller's name is placed in the certified device database.

Note that all standard services announced by a device on the network are tested and must be compliant for the device to be certified.

5.5.2. Types of Test Facilities

Two types of testing facilities are permitted for device testing: self testing (that is, the vendor who manufactures, owns or controls the device also tests it) and independent third-party testing (that is, an independent lab). Both types of facilities must use the tests licensed from OCF in accordance with the test license. Results from both types of test facilities will be reviewed equally by the Test Reviewer.

5.5.3. Test Tool Problems

Any Vendor that believes that test tool is flawed or seeks to add other input regarding the test tool should report this information to the Test Reviewer. The Test Reviewer then provides this input to the test authors, and the test authors may prioritize test tool issues based on the impact that they have on vendors (such as the severity of the problem, the number of devices impacted by the problem, and so on).

In the course of reporting problems with the test tool, the Vendor might propose a specific technical resolution for the problem. To obtain clear legal rights to incorporate such technical input into the test tool, the test author may require members who submit such input to first execute an agreement granting those rights.

Planned test tool versions are periodic (for example, semi-annually) to incorporate minor problem fixes. Special test tool versions may occur when necessary to fix high-priority problems or severe problems with no other workaround.

5.5.4. New (major) Versions of the Test Tool

If OCF posts a new major version of the test tool on the UPnP certification web site, then the vendor should begin testing with the new version as soon as practical. After a minimum of six months from the date OCF first posts the new major version on the UPnP certification web site, it is mandatory to use the revised test tool. This transition period is granted to avoid disruption to product development cycles. The number of new major test tool versions is anticipated to be small.

5.5.5. New (minor) Releases of the Test Tool

If OCF posts a new minor release of the test tool on the UPnP certification web site, then the vendor should begin testing with the new version as soon as practical. After a maximum of two (2) months from the date OCF first posts the new version on the UPnP certification web site, it is mandatory to use the revised test tool. Test logs from earlier releases of the test tool will not be accepted two months after a newer version has been released.

5.5.6. New Versions of the UPnP Architecture

If a new version of the UPnP architecture is introduced, then a corresponding new version of the test tool also will be introduced pursuant to the UPnP test tool development process. If the new architecture is backwards compatible with the previous one, the new test tool should work with devices based on the previous architecture. If the new architecture is not backwards compatible, devices based on the new architecture must use the new tool and devices based on the previous architecture must use the previous test tool.

Devices may continue to use previous versions of the architecture and test tool to the extent that the UPnP Work Group and OCF Board allows. The OCF Board will also address any certification mark issues associated with different architecture versions. The number of architecture versions is anticipated to be small.

5.5.7. Escalation of Test Issues

Under the conditions of this section, certification may be granted for a device that cannot pass a portion of the test because of an actual error or malfunction in the test tool or because the portion of the test that causes the device to fail does not apply to the device. If a device has not passed the applicable test but the Vendor in good faith contends that such failure was caused not by a lack of functionality in the device but by an error or malfunction in the applicable test, the following process will apply:

1. The vendor must first make all necessary attempts to pass the test by discussing the test issue with the Test Reviewer. If the issue is not resolved in this manner, the vendor may proceed to the following steps.
2. The vendor shall submit a detailed explanation of the test issue, in writing, to the Test Reviewer.
3. The Test Reviewer reviews the explanation and may make a recommendation about how to address the issue.
4. The Test Reviewer requests the vendor's permission to escalate this issue to the UPnP WG.
 - (a) If the vendor agrees to the escalation, the issue will be addressed by the UPnP WG, which determines whether to grant a waiver to the device or take other action, given the unique circumstance at hand.
 - (b) If the vendor does not agree to the escalation, the issue is handled by a panel of three independent reviewers. This panel is composed of one UPnP Work Group member selected by the vendor, one UPnP Work Group or Test Reviewer selected by OIC, and one person selected unanimously by the first two panel members. In the event the vendor fails to select a UPnP WG member for the panel within 30 days of notice to do so, the UPnP WG will select one UPnP WG and one Test Reviewer for the panel, and those two panel members will unanimously select the third panel member. The explanation of the issue and the Test Reviewer's recommendation are then forwarded to the review panel, which determines whether to grant a waiver to the device or take other action, given the unique circumstance at hand.
5. If the UPnP WG or review panel determines that the device would pass the test were it not for a proven problem or malfunction in the test tool, or that the portion of the test causing the failure does not apply to the device, then OCF will grant certification to the device.

5.5.8. Support for UPnP Certified Devices

The vendor is responsible for all service calls from its customers regarding UPnP-related questions. OCF has no responsibility for end user customer service calls. Further, the vendor is responsible for debugging its devices. OCF will not aid vendors in designing or debugging their devices except as set forth in Section 5.5.7 above.

5.5.9. Enforcement of the UPnP Device Certification Process

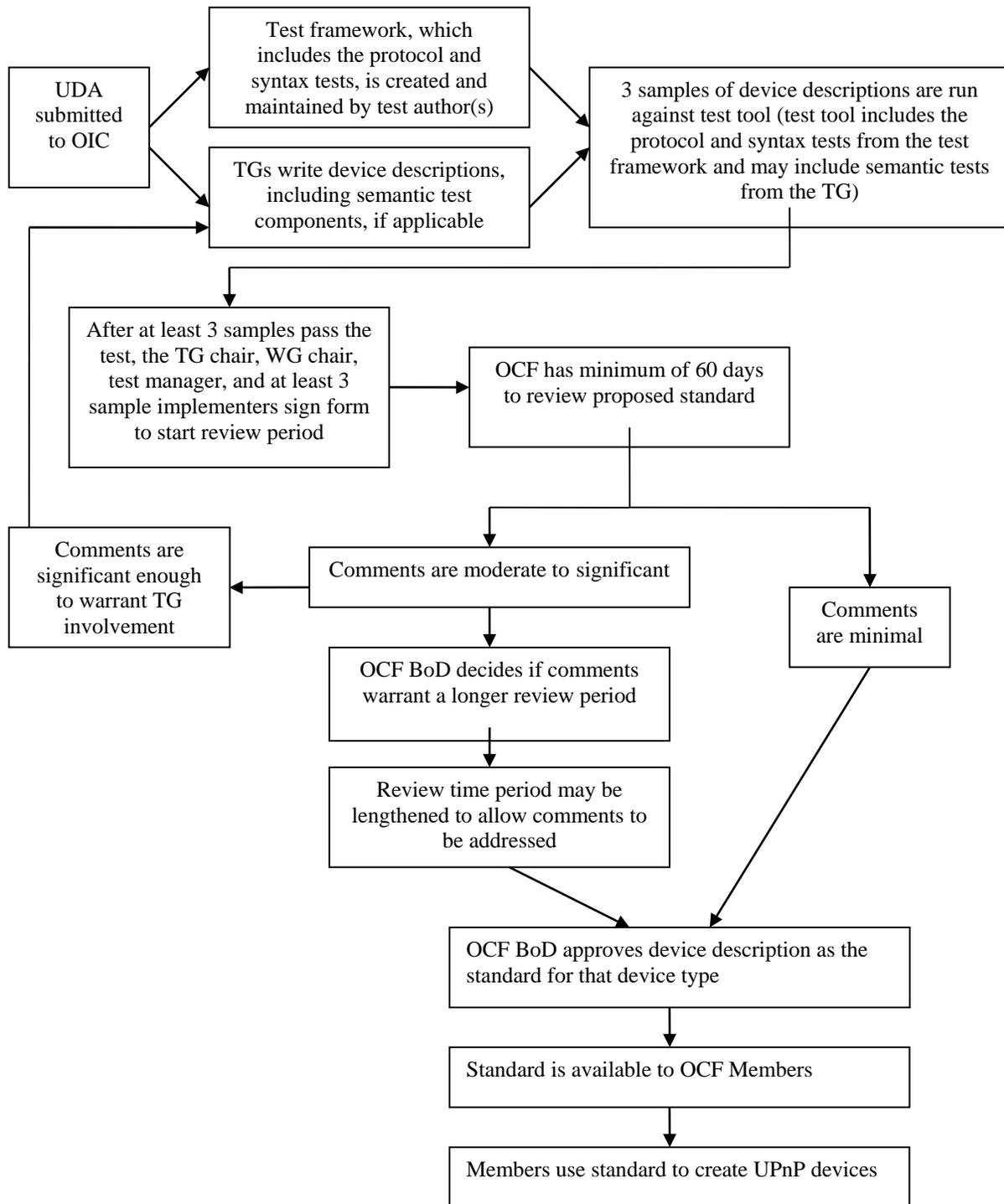
The types and level of enforcement used by OCF will be decided by the OCF Board and UPnP WG. In making decisions about potential actions against any party (for example, “cease and desist” instructions or formal legal action), the OCF Board will enforce the terms of UPnP certification and logo usage requirements. The following factors, without limitation, will be considered or taken into account:

- The severity of the impact to the value of the UPnP® certification mark and brand
- Malicious versus inadvertent actions
- The potential harm to consumers and the marketplace

Appendix A

Creation of Device Standards For UPnP Certification Flow Chart

Creation of Standards For UPnP Certification



Abbreviations: UDA – UPnP Device Architecture
WG – Work Group
TG – Task Group
BoD – Board of Directors

Appendix B

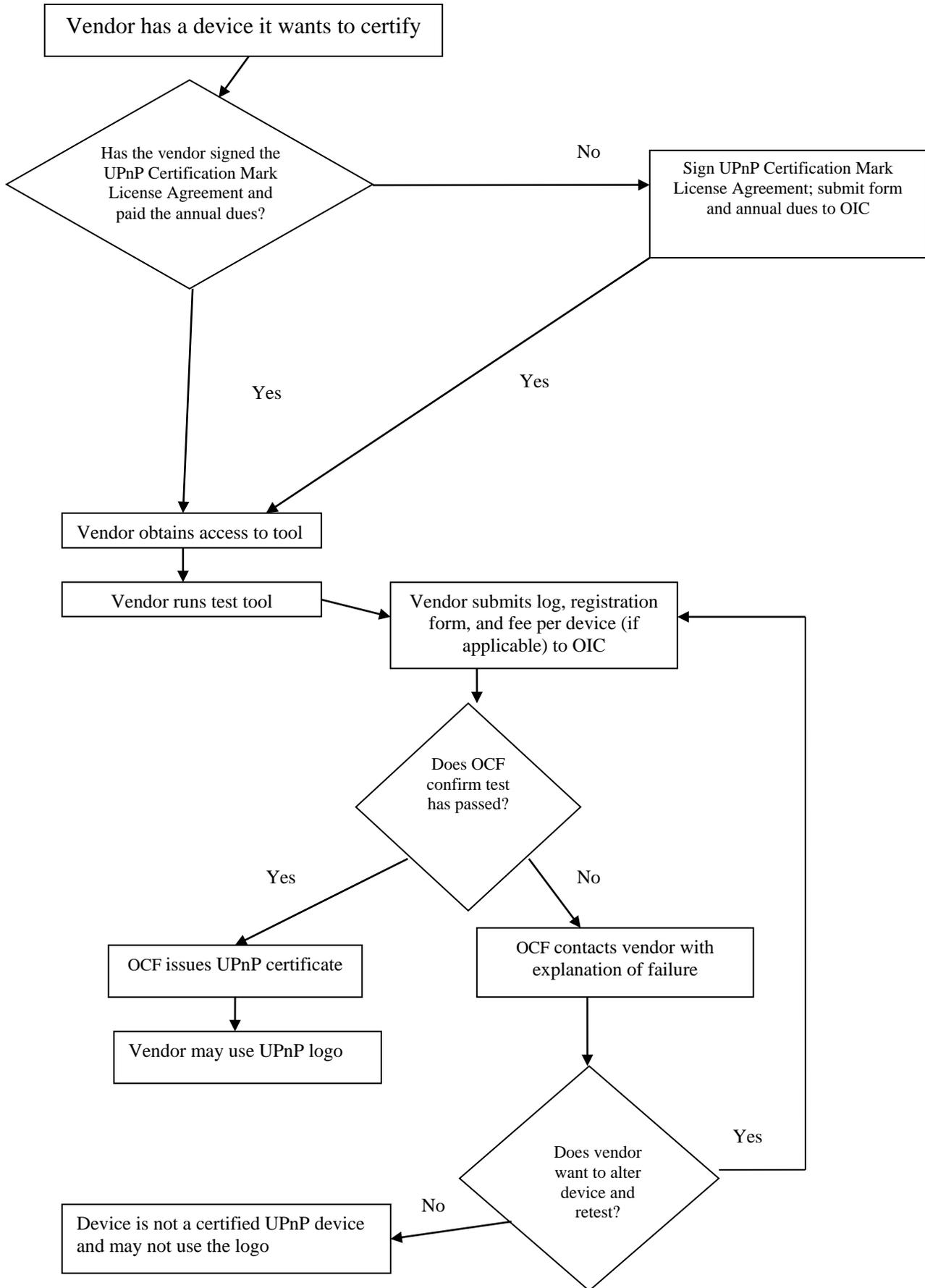
Device Registration Form For UPnP Certification

(<https://members.upnp.org/default.asp>)

Appendix C

UPnP Device Certification Flow Chart

Device Certification Flow Chart



Appendix D

60-Day Review Sign-off Sheet

This document was approved by the OCF UPnP Work Group on 1/01/2016.

Introduction:

There will be a 60-Day Comment & Disclosure Period for all Proposed Device Control Protocols (DCP) prior to them being voted as Standardized DCPs by the OCF Board of Directors. The following sign-off sheet enumerates the key parties who attest that certain requirements have been met in order to start the 60-day Comment & Disclosure Period.

Once the parties have signed, the OCF Administration will notify the general Membership via e-mail and post the Proposed DCP to the Document Archive of the member only section of the OCF Web site, officially starting the clock on the 60-Day Comment & Disclosure Period.

From Section 2.1 of the OCF Bylaws:

Review of Draft Specifications. During the course of developing a Final Specification, if the chairperson of a Work Group determines, in accordance with procedures to be approved by the Board of Directors, that a Draft Specification is sufficiently substantial and defined so as to provide for meaningful review by the Members, he or she may direct the Executive Director to initiate a review. Upon receipt of such direction, the Executive Director shall distribute to each Member a notice of review period and a complete draft of the Draft Specification that is the subject of such notice ("Review Notice"). Each Member, on behalf of itself and its Affiliates, shall have sixty (60) days following the date of the receipt of such Review Notice ("Review Period") to review such Draft Specification and consider any potential licensing obligations that may accrue with respect to any Necessary Claims if the Draft Specification is adopted as a Final Specification. It is anticipated that one or more Review Periods shall occur during the course of developing a Final Specification.

Terms:

"DCP" means device control protocol, including those portions of any Approved DCP Framework that are utilized by the device control protocol, which protocol enables interaction between a device associated with one Device Class and devices associated with the same or different Device Classes in a networked environment.

"Reference Implementation" means an implementation of a Proposed DCP and developed as part of the TG specification development process.

"Proposed DCPs" means the specification defining the set of DCPs for a particular Device Class created by a TG or submission to the UPnP WG and OCF Board for adoption as Standardized DCPs.

"Standardized DCPs" means the Proposed DCPs that have been approved by the OCF Board as set forth in Section 2.1 of the OCF IPR Policy.

"Sample Test Complete (STC)" means the Sample Reference Implementation is fully functional, demonstrates proof of concept per the UPnP test template and is submitted to the UPnP WG for Proposed DCP approval. Fully functional does not imply semantic compliance, which is left to the individual TGs discretion.

"Template Design Complete (TDC)" means UPnP design template has been evaluated against the TDC checklist and is frozen by the TG at Rev .9x (version number to be documented) for Sample Reference Implementation and Test.

Version and Date:

For the purpose of this form:

- The UPnP Device Architecture version is: <UDA version number>
- The UPnP Certification Test Tool* version is: <Test Tool version number>
- The Proposed DCP is: <name and version number>
- The date: <date of last obtained signature>

Summary tables of the devices and services in the DCP and the corresponding number of Reference Implementations and table of required XML Configuration Files are below. Auxiliary material(s) may be submitted to help in the interpretation and correct implementation of the specification.

To be completed by TG Chair:

	<i>R</i> <i>(required)</i>	<i>O</i> <i>(optional)</i>	<i>Number of</i> <i>Reference</i> <i>Implementations</i>
Device			
<i>Service</i>			
<i>Service</i>			
Device			
<i>Service</i>			
<i>Service</i>			

<i>List of XML Configuration Files Required to Pass the Certification Test Tool for this DCP</i>

<ul style="list-style-type: none"> • Yes, I am submitting auxiliary material as part of the review. 	<ul style="list-style-type: none"> • No, I am not submitting auxiliary material as part of the review.
<i>List of auxiliary material(s) submitted with this Proposed DCP (i.e. use case scenario, whitepaper, etc.)</i>	

** The UPnP Certification Test Tool is provided for pre-certification purposes by OIC. In order to certify devices, vendors are required to follow the certification process as outlined by OIC.*

The following parties hereby attest that:

- **TG Chair/Co-Chair** – This Proposed DCP is based on the UPnP VX Device Architecture and has been reviewed against the TDC checklist. The TG has declared it design complete. There are no known design issues. The DCP features comply with the design goals set forth and approved by the TG. Furthermore, the requisite number of Sample Reference Implementations, which implement the required features in the DCP, passed testing, including testing against the required XML configuration files for this DCP (as listed in the above table), by producing a pass test log against the UPnP Certification Test Tool.

Signature: _____ Date: _____

- **TG Co-Chair** (if applicable) – This Proposed DCP is based on the UPnP VX Device Architecture and has been reviewed against the TDC checklist. The TG has declared it design complete. There are no known design issues. The DCP features comply with the design goals set forth and approved by the TG. Furthermore, the requisite number of Sample Reference Implementations, which implement the required features in the DCP, passed testing, including testing against the required XML configuration files for this DCP (as listed in the above table), by producing a pass test log against the UPnP Certification Test Tool

Signature: _____ Date: _____

- **UPnP Work Group Chair** – The UPnP WG has audited the Proposed DCP and there are no known design issues. The Proposed DCP generally follows the guidelines advocated by the UPnP WG.

Signature: _____ Date: _____

- **UPnP Work Group Vice Chair** – The UPnP WG has audited the Proposed DCP and there are no known design issues. The Proposed DCP generally follows the guidelines advocated by the UPnP WG.

Signature: _____ Date: _____

- **Sample Reference Implementer 1 / [Name of Company]** – This Proposed DCP is sample test complete (STC). My implementation produced a pass test log against the UPnP Certification Test Tool.

I include a list of all devices and services in my implementation:

Device	
<i>Service</i>	
<i>Service</i>	

Signature: _____ Date: _____

- **Sample Reference Implementer 2 / [Name of Company]** – This Proposed DCP is sample test complete (STC). My implementation produced a pass test log against the UPnP Certification Test Tool.

I include a list of all devices and services in my implementation:

Device	
<i>Service</i>	
<i>Service</i>	

Signature: _____ Date: _____

- **Sample Reference Implementer 3 / [Name of Company]** – This Proposed DCP is sample test complete (STC). My implementation produced a pass test log against the UPnP Certification Test Tool.

I include a list of all devices and services in my implementation:

Device	
<i>Service</i>	
<i>Service</i>	

Signature: _____ Date: _____

- **Sample Reference Implementer 4 / [Name of Company]** – This Proposed DCP is sample test complete (STC). My implementation produced a pass test log against the UPnP Certification Test Tool.

I include a list of all devices and services in my implementation:

Device	
<i>Service</i>	
<i>Service</i>	

Signature: _____ Date: _____

- **Sample Reference Implementer 5 / [Name of Company]** – This Proposed DCP is sample test complete (STC). My implementation produced a pass test log against the UPnP Certification Test Tool.

I include a list of all devices and services in my implementation:

Device	
<i>Service</i>	
<i>Service</i>	

Signature: _____ Date: _____

- **Sample Reference Implementer 6 / [Name of Company]** – This Proposed DCP is sample test complete (STC). My implementation produced a pass test log against the UPnP Certification Test Tool.

I include a list of all devices and services in my implementation:

Device	
<i>Service</i>	
<i>Service</i>	

Signature: _____ Date: _____

- **UPnP Work Group Chair** – This test tool performs testing according to the UPnP Device Architecture VX and to the Proposed DCP. Furthermore, the test tool has been successfully applied to the Sample Reference Implementations above and has produced pass test logs.

Signature: _____ Date: _____

- **OCF Administration** – This form carries the signatures of the appropriate individuals, which implies that all requirements are in place to kick-off the OIC-wide 60-Day Comment & Disclosure Period.

Signature: _____ Date: _____